Full wwPDB X-ray Structure Validation Report ⓘ

Oct 31, 2022 – 10:03 AM EDT

PDB ID	:	8H2C
Title	:	Crystal structure of the pseudaminic acid synthase PseI from Campylobacter jejuni
Authors	:	Song, W.S.; Park, M.A.; Ki, D.U.; Yoon, S.I.
Deposited on	:	2022-10-05
Resolution	:	2.90 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at *validation@mail.wwpdb.org*
A user guide is available at
https://www.wwpdb.org/validation/2017/XrayValidationReportHelp
with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at
http://www.wwpdb.org/validation/2017/FAQs#types.

The following versions of software and data (see references ⓘ) were used in the production of this report:

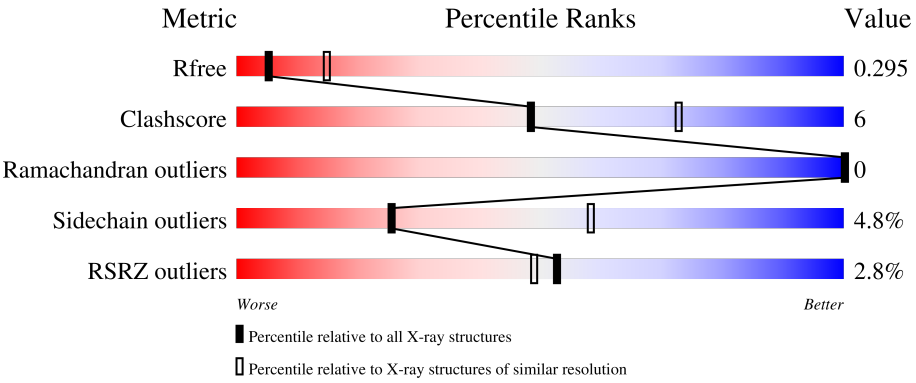
MolProbity	:	4.02b-467
Xtriage (Phenix)	:	1.13
EDS	:	2.31.2
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac	:	5.8.0158
CCP4	:	7.0.044 (Gargrove)
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.31.2

1 Overall quality at a glance (i)

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.90 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1957 (2.90-2.90)
Clashscore	141614	2172 (2.90-2.90)
Ramachandran outliers	138981	2115 (2.90-2.90)
Sidechain outliers	138945	2117 (2.90-2.90)
RSRZ outliers	127900	1906 (2.90-2.90)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for >=3, 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions <=5% The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	349	3% 80% 17% ••
1	B	349	3% 82% 13% 5%
1	C	349	3% 78% 19% ••
1	D	349	% 78% 19% ••

2 Entry composition (i)

There are 3 unique types of molecules in this entry. The entry contains 10303 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Pseudaminic acid synthase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	342	Total	C	N	O	S	0	0	0
			2596	1677	418	492	9			
1	B	333	Total	C	N	O	S	0	0	0
			2517	1622	407	479	9			
1	C	341	Total	C	N	O	S	0	0	0
			2561	1649	413	492	7			
1	D	341	Total	C	N	O	S	0	0	0
			2577	1665	418	486	8			

There are 40 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	GLY	-	expression tag	UNP A0A6C7NV50
A	-4	SER	-	expression tag	UNP A0A6C7NV50
A	-3	ALA	-	expression tag	UNP A0A6C7NV50
A	-2	LYS	-	expression tag	UNP A0A6C7NV50
A	-1	ASP	-	expression tag	UNP A0A6C7NV50
A	0	PRO	-	expression tag	UNP A0A6C7NV50
A	185	ALA	THR	conflict	UNP A0A6C7NV50
A	238	SER	ASN	conflict	UNP A0A6C7NV50
A	270	ASP	GLY	conflict	UNP A0A6C7NV50
A	299	ILE	MET	conflict	UNP A0A6C7NV50
B	-5	GLY	-	expression tag	UNP A0A6C7NV50
B	-4	SER	-	expression tag	UNP A0A6C7NV50
B	-3	ALA	-	expression tag	UNP A0A6C7NV50
B	-2	LYS	-	expression tag	UNP A0A6C7NV50
B	-1	ASP	-	expression tag	UNP A0A6C7NV50
B	0	PRO	-	expression tag	UNP A0A6C7NV50
B	185	ALA	THR	conflict	UNP A0A6C7NV50
B	238	SER	ASN	conflict	UNP A0A6C7NV50
B	270	ASP	GLY	conflict	UNP A0A6C7NV50
B	299	ILE	MET	conflict	UNP A0A6C7NV50
C	-5	GLY	-	expression tag	UNP A0A6C7NV50

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Chain	Residue	Modelled	Actual	Comment	Reference
C	-4	SER	-	expression tag	UNP A0A6C7NV50
C	-3	ALA	-	expression tag	UNP A0A6C7NV50
C	-2	LYS	-	expression tag	UNP A0A6C7NV50
C	-1	ASP	-	expression tag	UNP A0A6C7NV50
C	0	PRO	-	expression tag	UNP A0A6C7NV50
C	185	ALA	THR	conflict	UNP A0A6C7NV50
C	238	SER	ASN	conflict	UNP A0A6C7NV50
C	270	ASP	GLY	conflict	UNP A0A6C7NV50
C	299	ILE	MET	conflict	UNP A0A6C7NV50
D	-5	GLY	-	expression tag	UNP A0A6C7NV50
D	-4	SER	-	expression tag	UNP A0A6C7NV50
D	-3	ALA	-	expression tag	UNP A0A6C7NV50
D	-2	LYS	-	expression tag	UNP A0A6C7NV50
D	-1	ASP	-	expression tag	UNP A0A6C7NV50
D	0	PRO	-	expression tag	UNP A0A6C7NV50
D	185	ALA	THR	conflict	UNP A0A6C7NV50
D	238	SER	ASN	conflict	UNP A0A6C7NV50
D	270	ASP	GLY	conflict	UNP A0A6C7NV50
D	299	ILE	MET	conflict	UNP A0A6C7NV50

- Molecule 2 is MANGANESE (II) ION (three-letter code: MN) (formula: Mn) (labeled as "Ligand of Interest" by depositor).

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
2	A	1	Total Mn 1 1	0	0
2	B	1	Total Mn 1 1	0	0
2	C	1	Total Mn 1 1	0	0
2	D	1	Total Mn 1 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	13	Total O 13 13	0	0
3	B	17	Total O 17 17	0	0
3	C	10	Total O 10 10	0	0

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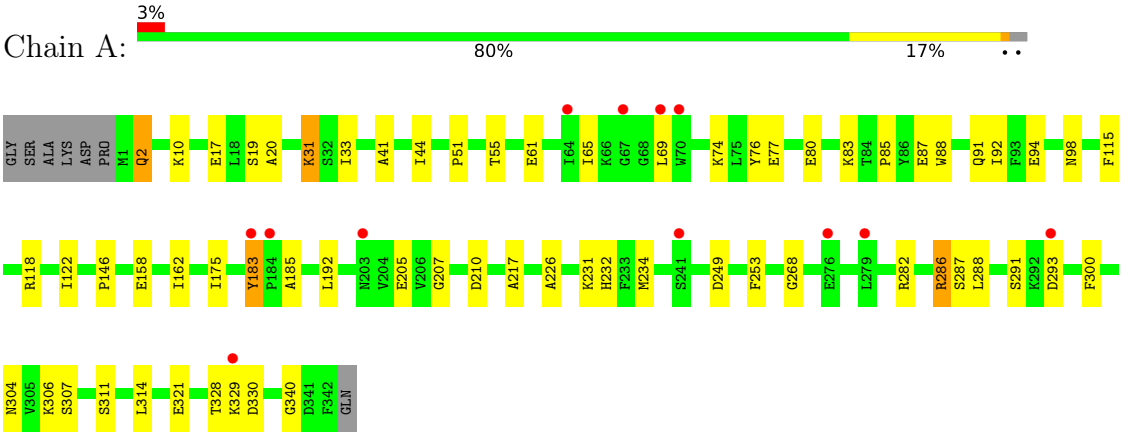
Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	D	8	Total O 8 8	0	0

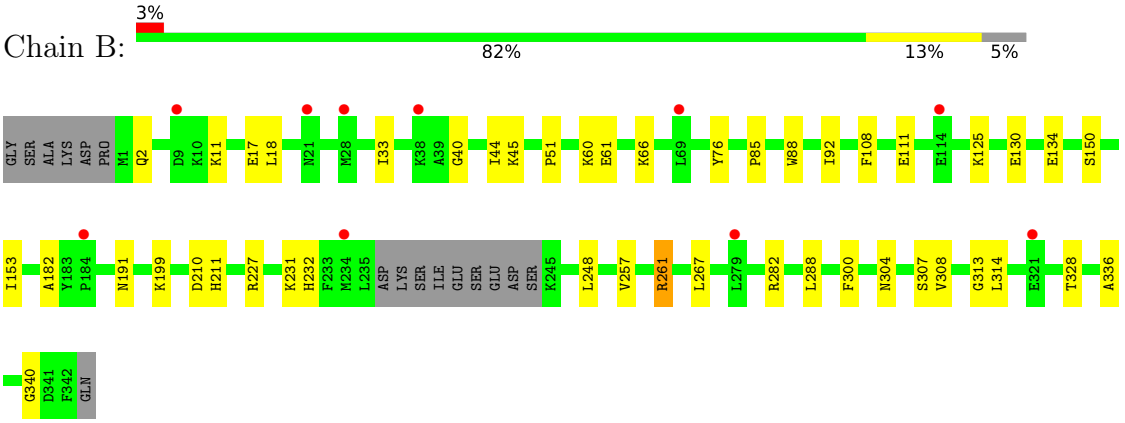
3 Residue-property plots (i)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

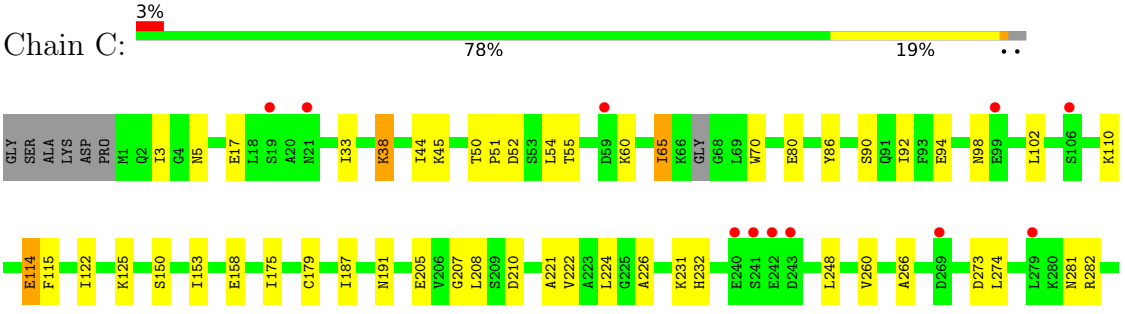
• Molecule 1: Pseudaminic acid synthase



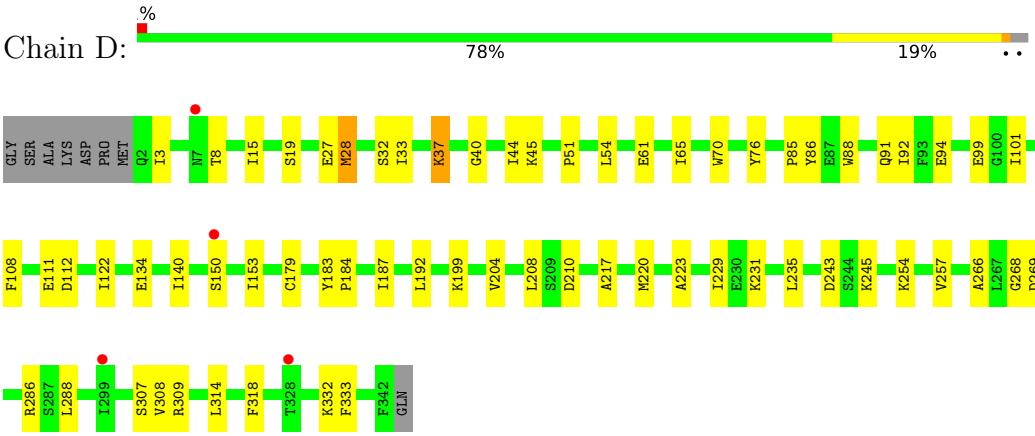
• Molecule 1: Pseudaminic acid synthase



• Molecule 1: Pseudaminic acid synthase



• Molecule 1: Pseudaminic acid synthase



4 Data and refinement statistics (i)

Property	Value	Source
Space group	P 4 21 2	Depositor
Cell constants a, b, c, α, β, γ	176.81Å 176.81Å 99.82Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	30.00 – 2.90 29.47 – 2.86	Depositor EDS
% Data completeness (in resolution range)	97.2 (30.00-2.90) 96.1 (29.47-2.86)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	1.27 (at 2.85Å)	Xtriage
Refinement program	PHENIX 1.15.2_3472	Depositor
R, R_{free}	0.245 , 0.295 0.245 , 0.295	Depositor DCC
R_{free} test set	1796 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å^2)	47.8	Xtriage
Anisotropy	0.255	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.32 , 45.1	EDS
L-test for twinning[2]	$< \|L\| > = 0.53$, $< L^2 > = 0.37$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o,F_c correlation	0.89	EDS
Total number of atoms	10303	wwPDB-VP
Average B, all atoms (Å^2)	46.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.21% of the height of the origin peak. No significant pseudotranslation is detected.*

[1] Intensities estimated from amplitudes.

[2] Theoretical values of $< |L| >$, $< L^2 >$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: MN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\#\|Z\| > 5$	RMSZ	$\#\|Z\| > 5$
1	A	0.28	0/2648	0.45	0/3579
1	B	0.28	0/2566	0.46	0/3468
1	C	0.28	0/2611	0.47	0/3535
1	D	0.28	0/2629	0.45	0/3555
All	All	0.28	0/10454	0.46	0/14137

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2596	0	2480	33	0
1	B	2517	0	2402	29	0
1	C	2561	0	2409	40	0
1	D	2577	0	2458	37	0
2	A	1	0	0	0	0
2	B	1	0	0	0	0
2	C	1	0	0	0	0
2	D	1	0	0	0	0
3	A	13	0	0	0	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	B	17	0	0	0	0
3	C	10	0	0	1	0
3	D	8	0	0	0	0
All	All	10303	0	9749	120	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 6.

All (120) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:74:LYS:HB2	1:A:77:GLU:HG3	1.60	0.83
1:B:66:LYS:HE2	1:C:299:ILE:HG12	1.65	0.77
1:B:210:ASP:HB3	1:B:231:LYS:HE2	1.70	0.73
1:D:150:SER:OG	1:D:179:CYS:SG	2.49	0.71
1:A:282:ARG:NH1	1:B:153:ILE:O	2.25	0.70
1:C:210:ASP:HB3	1:C:231:LYS:HE2	1.76	0.67
1:B:125:LYS:NZ	1:B:150:SER:OG	2.28	0.67
1:B:288:LEU:HB2	1:B:314:LEU:HB2	1.79	0.65
1:D:210:ASP:HB3	1:D:231:LYS:HE2	1.81	0.62
1:A:192:LEU:HD11	1:A:217:ALA:HA	1.82	0.62
1:C:266:ALA:HB2	1:D:187:ILE:HG22	1.83	0.61
1:C:288:LEU:HB2	1:C:314:LEU:HB2	1.83	0.59
1:D:288:LEU:HB2	1:D:314:LEU:HB2	1.86	0.57
1:D:183:TYR:CG	1:D:184:PRO:HA	2.40	0.57
1:C:158:GLU:OE1	1:D:282:ARG:NH1	2.37	0.57
1:D:33:ILE:HD11	1:D:92:ILE:HG23	1.87	0.57
1:C:191:ASN:HD22	1:D:268:GLY:HA3	1.70	0.56
1:C:51:PRO:HG2	1:C:80:GLU:HG2	1.88	0.56
1:C:150:SER:OG	1:C:179:CYS:SG	2.63	0.56
1:D:3:ILE:HG22	1:D:122:ILE:HD12	1.86	0.56
1:A:268:GLY:HA3	1:B:191:ASN:HA	1.88	0.56
1:D:19:SER:OG	1:D:243:ASP:OD2	2.24	0.56
1:C:286:ARG:NH1	1:C:307:SER:O	2.39	0.55
1:B:11:LYS:HG2	1:B:261:ARG:HH12	1.71	0.54
1:A:19:SER:OG	1:A:20:ALA:N	2.41	0.54
1:C:86:TYR:HB3	1:C:115:PHE:CZ	2.42	0.54
1:D:86:TYR:OH	1:D:112:ASP:OD1	2.25	0.54
1:A:51:PRO:HB2	1:A:76:TYR:CZ	2.43	0.54
1:C:282:ARG:O	1:C:282:ARG:HG3	2.07	0.53
1:B:51:PRO:HB2	1:B:76:TYR:CZ	2.44	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:17:GLU:HB2	1:B:232:HIS:HA	1.91	0.52
1:C:33:ILE:HD11	1:C:92:ILE:HG23	1.91	0.52
1:A:329:LYS:HG2	1:A:330:ASP:N	2.24	0.52
1:B:45:LYS:HD2	1:B:125:LYS:HG2	1.93	0.51
1:C:175:ILE:HG12	1:C:205:GLU:HB3	1.93	0.51
1:A:210:ASP:HB3	1:A:231:LYS:HD3	1.93	0.50
1:C:60:LYS:NZ	1:D:333:PHE:O	2.45	0.50
1:A:158:GLU:O	1:A:162:ILE:HG13	2.12	0.49
1:A:291:SER:HB3	1:A:306:LYS:HB2	1.94	0.49
1:D:286:ARG:NH1	1:D:307:SER:O	2.42	0.49
1:A:41:ALA:HB2	1:A:253:PHE:HE1	1.78	0.49
1:C:187:ILE:CG2	1:D:266:ALA:HB2	2.42	0.49
1:A:87:GLU:OE1	1:A:87:GLU:N	2.46	0.48
1:D:37:LYS:HG2	1:D:101:ILE:HB	1.95	0.48
1:A:286:ARG:NE	1:B:130:GLU:OE2	2.40	0.47
1:B:61:GLU:O	1:B:66:LYS:NZ	2.47	0.47
1:B:33:ILE:HD11	1:B:92:ILE:HG23	1.97	0.47
1:A:234:MET:O	1:A:249:ASP:HA	2.15	0.47
1:B:85:PRO:HD2	1:B:88:TRP:CE3	2.49	0.47
1:B:111:GLU:OE2	1:B:111:GLU:N	2.46	0.47
1:C:224:LEU:HG	1:D:223:ALA:HB1	1.96	0.47
1:B:40:GLY:HA3	1:B:257:VAL:HG11	1.96	0.47
1:C:102:LEU:HD22	1:C:122:ILE:HD13	1.97	0.47
1:A:183:TYR:HA	1:A:185:ALA:N	2.30	0.47
1:B:328:THR:OG1	1:B:340:GLY:O	2.29	0.46
1:A:85:PRO:HD2	1:A:88:TRP:CE3	2.51	0.46
1:D:32:SER:HA	1:D:235:LEU:HD13	1.97	0.46
1:A:2:GLN:HE21	1:A:2:GLN:HB3	1.55	0.45
1:C:3:ILE:HG22	1:C:122:ILE:HD12	1.97	0.45
1:D:85:PRO:HD2	1:D:88:TRP:CE3	2.51	0.45
1:B:18:LEU:HB2	1:B:44:ILE:HD11	1.97	0.45
1:A:328:THR:OG1	1:A:340:GLY:O	2.30	0.45
1:D:40:GLY:HA3	1:D:257:VAL:HG11	1.99	0.45
1:B:313:GLY:HA2	1:B:336:ALA:HB1	1.98	0.45
1:A:175:ILE:HG12	1:A:205:GLU:HB3	1.99	0.45
1:A:17:GLU:HB2	1:A:232:HIS:HA	1.99	0.44
1:B:11:LYS:HE2	1:B:261:ARG:NH1	2.32	0.44
1:C:328:THR:OG1	1:C:340:GLY:O	2.29	0.44
1:D:208:LEU:HB3	1:D:229:ILE:HD13	1.99	0.44
1:A:122:ILE:O	1:A:146:PRO:HD2	2.18	0.44
1:A:288:LEU:HB2	1:A:314:LEU:HB2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:325:LYS:HG2	1:C:342:PHE:HD2	1.83	0.44
1:B:300:PHE:HA	1:B:304:ASN:HD21	1.82	0.44
1:C:65:ILE:HB	1:C:70:TRP:O	2.17	0.44
1:C:231:LYS:HD2	1:C:248:LEU:HD11	2.00	0.44
1:D:199:LYS:HG2	1:D:204:VAL:O	2.17	0.44
1:A:55:THR:HA	1:B:308:VAL:HB	2.00	0.43
1:A:33:ILE:HD11	1:A:92:ILE:HG23	2.00	0.43
1:C:281:ASN:ND2	3:C:502:HOH:O	2.44	0.43
1:D:51:PRO:HB2	1:D:76:TYR:CZ	2.52	0.43
1:D:65:ILE:HB	1:D:70:TRP:O	2.18	0.43
1:C:55:THR:HA	1:D:308:VAL:HB	2.00	0.43
1:C:294:ILE:HB	1:C:331:ILE:HB	2.01	0.43
1:C:287:SER:HB3	1:C:311:SER:HA	2.01	0.43
1:C:17:GLU:HB2	1:C:232:HIS:HA	2.01	0.43
1:C:45:LYS:HD2	1:C:125:LYS:HG2	1.99	0.43
1:C:94:GLU:O	1:C:98:ASN:ND2	2.52	0.43
1:D:28:MET:HE3	1:D:28:MET:HB2	1.93	0.43
1:D:111:GLU:OE2	1:D:111:GLU:N	2.50	0.43
1:C:208:LEU:HD22	1:C:221:ALA:HB2	2.01	0.42
1:A:115:PHE:HD2	1:A:118:ARG:HH11	1.67	0.42
1:C:266:ALA:HB3	1:D:220:MET:HE1	2.02	0.42
1:A:287:SER:HB3	1:A:311:SER:HA	2.02	0.42
1:C:207:GLY:HA2	1:C:226:ALA:HB1	2.02	0.42
1:D:192:LEU:HD11	1:D:217:ALA:HA	2.01	0.42
1:D:15:ILE:HD13	1:D:104:PHE:HZ	1.84	0.42
1:A:80:GLU:O	1:A:83:LYS:HG2	2.20	0.41
1:A:286:ARG:HG3	1:A:307:SER:OG	2.20	0.41
1:C:153:ILE:O	1:D:282:ARG:NH2	2.54	0.41
1:C:54:LEU:HD22	1:D:309:ARG:CZ	2.50	0.41
1:B:231:LYS:HD2	1:B:248:LEU:HD11	2.03	0.41
1:C:38:LYS:HE3	1:C:38:LYS:HB3	1.80	0.41
1:A:300:PHE:HA	1:A:304:ASN:HD21	1.86	0.41
1:B:267:LEU:HD12	1:B:267:LEU:HA	1.88	0.41
1:A:207:GLY:HA2	1:A:226:ALA:HB1	2.02	0.41
1:A:286:ARG:NH1	1:B:108:PHE:O	2.54	0.41
1:C:110:LYS:O	1:C:114:GLU:HG2	2.21	0.41
1:C:187:ILE:HG22	1:D:266:ALA:HB2	2.03	0.41
1:C:274:LEU:HD21	1:D:153:ILE:O	2.20	0.41
1:D:45:LYS:HD3	1:D:106:SER:HB2	2.03	0.41
1:D:314:LEU:HD22	1:D:318:PHE:CD1	2.56	0.41
1:B:60:LYS:HE2	1:B:60:LYS:HB3	1.95	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:182:ALA:HB2	1:B:211:HIS:HB3	2.03	0.40
1:A:158:GLU:OE1	1:B:282:ARG:NH2	2.54	0.40
1:D:54:LEU:HD21	1:D:108:PHE:CD1	2.56	0.40
1:C:114:GLU:HG2	1:C:114:GLU:H	1.64	0.40
1:A:31:LYS:HB2	1:A:31:LYS:HE2	1.90	0.40
1:B:261:ARG:N	1:B:261:ARG:HD3	2.35	0.40
1:C:222:VAL:HG21	1:C:260:VAL:HG13	2.04	0.40
1:D:235:LEU:HD12	1:D:235:LEU:HA	1.92	0.40

There are no symmetry-related clashes.

5.3 Torsion angles (i)

5.3.1 Protein backbone (i)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	340/349 (97%)	338 (99%)	2 (1%)	0	100	100
1	B	329/349 (94%)	327 (99%)	2 (1%)	0	100	100
1	C	337/349 (97%)	334 (99%)	3 (1%)	0	100	100
1	D	339/349 (97%)	337 (99%)	2 (1%)	0	100	100
All	All	1345/1396 (96%)	1336 (99%)	9 (1%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains (i)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	256/297 (86%)	242 (94%)	14 (6%)	21	53
1	B	249/297 (84%)	243 (98%)	6 (2%)	49	79
1	C	250/297 (84%)	237 (95%)	13 (5%)	23	55
1	D	253/297 (85%)	238 (94%)	15 (6%)	19	49
All	All	1008/1188 (85%)	960 (95%)	48 (5%)	25	58

All (48) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	2	GLN
1	A	10	LYS
1	A	31	LYS
1	A	44	ILE
1	A	61	GLU
1	A	65	ILE
1	A	69	LEU
1	A	91	GLN
1	A	94	GLU
1	A	98	ASN
1	A	183	TYR
1	A	286	ARG
1	A	293	ASP
1	A	321	GLU
1	B	2	GLN
1	B	134	GLU
1	B	199	LYS
1	B	227	ARG
1	B	261	ARG
1	B	307	SER
1	C	5	ASN
1	C	38	LYS
1	C	44	ILE
1	C	50	THR
1	C	52	ASP
1	C	65	ILE
1	C	90	SER
1	C	114	GLU
1	C	273	ASP
1	C	321	GLU
1	C	322	LEU
1	C	329	LYS
1	C	332	LYS

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Mol	Chain	Res	Type
1	D	8	THR
1	D	27	GLU
1	D	28	MET
1	D	37	LYS
1	D	44	ILE
1	D	61	GLU
1	D	91	GLN
1	D	94	GLU
1	D	99	GLU
1	D	134	GLU
1	D	140	ILE
1	D	245	LYS
1	D	254	LYS
1	D	269	ASP
1	D	332	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	2	GLN
1	A	135	ASN
1	A	339	GLN
1	B	2	GLN
1	C	98	ASN
1	C	191	ASN

5.3.3 RNA (i)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates (i)

There are no monosaccharides in this entry.

5.6 Ligand geometry

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled '#RSRZ> 2' contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95^{th} percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled 'Q< 0.9' lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2			OWAB(Å^2)	Q<0.9
1	A	342/349 (97%)	0.37	12 (3%)	44	38	23, 42, 74, 107	0
1	B	333/349 (95%)	0.40	10 (3%)	50	45	28, 46, 67, 93	0
1	C	341/349 (97%)	0.39	11 (3%)	47	43	26, 47, 79, 107	0
1	D	341/349 (97%)	0.30	5 (1%)	73	73	25, 45, 66, 108	0
All	All	1357/1396 (97%)	0.37	38 (2%)	53	49	23, 45, 73, 108	0

All (38) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	A	67	GLY	3.8
1	A	276	GLU	3.3
1	C	21	ASN	3.2
1	C	241	SER	3.2
1	C	269	ASP	2.9
1	A	69	LEU	2.8
1	B	9	ASP	2.7
1	A	183	TYR	2.7
1	B	28	MET	2.7
1	A	241	SER	2.6
1	D	328	THR	2.6
1	D	299	ILE	2.5
1	B	234	MET	2.5
1	D	7	ASN	2.5
1	A	64	ILE	2.5
1	B	21	ASN	2.4
1	A	329	LYS	2.4
1	A	70	TRP	2.4
1	C	106	SER	2.4
1	B	114	GLU	2.4
1	C	243	ASP	2.4

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Mol	Chain	Res	Type	RSRZ
1	A	184	PRO	2.3
1	C	279	LEU	2.3
1	C	99	GLU	2.3
1	C	19	SER	2.3
1	B	184	PRO	2.3
1	D	150	SER	2.3
1	C	59	ASP	2.3
1	B	69	LEU	2.2
1	B	321	GLU	2.2
1	C	240	GLU	2.2
1	B	279	LEU	2.1
1	C	242	GLU	2.1
1	B	38	LYS	2.1
1	A	279	LEU	2.1
1	D	279	LEU	2.1
1	A	293	ASP	2.0
1	A	203	ASN	2.0

6.2 Non-standard residues in protein, DNA, RNA chains (i)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates (i)

There are no monosaccharides in this entry.

6.4 Ligands (i)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95^{th} percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

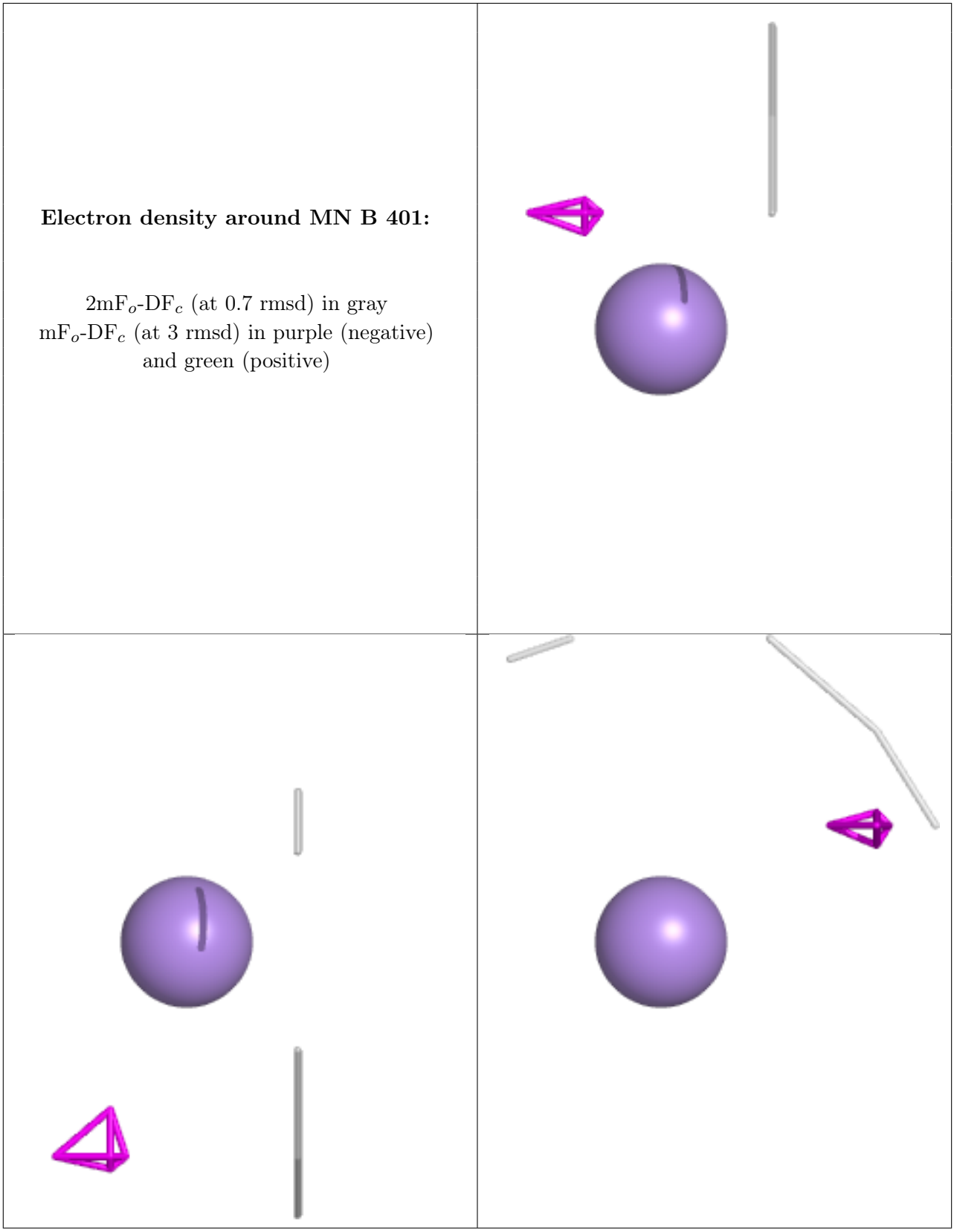
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å^2)	Q<0.9
2	MN	B	401	1/1	0.91	0.09	49,49,49,49	0
2	MN	C	401	1/1	0.92	0.20	41,41,41,41	0
2	MN	A	401	1/1	0.97	0.12	37,37,37,37	0
2	MN	D	401	1/1	0.97	0.14	28,28,28,28	0

The following is a graphical depiction of the model fit to experimental electron density of all

instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

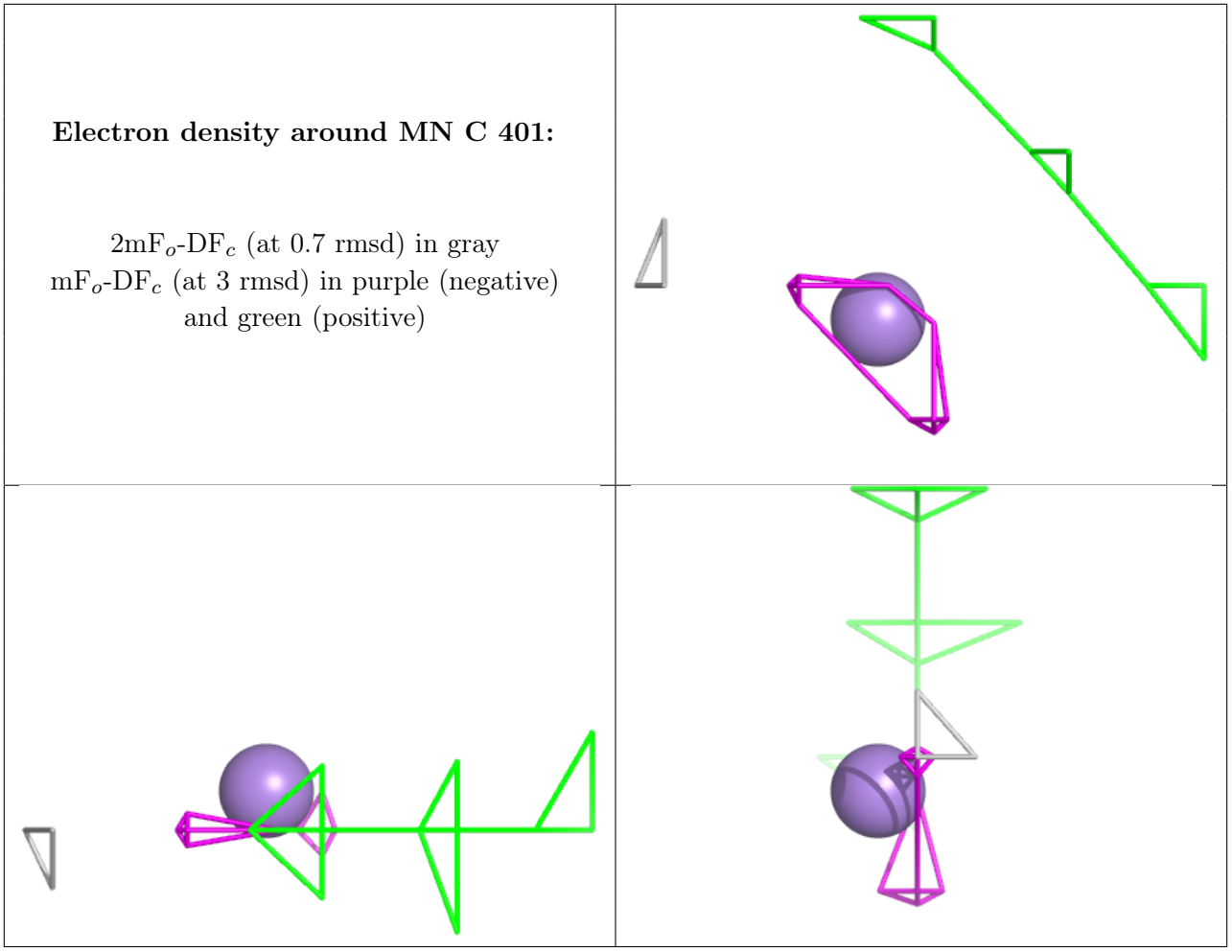
Electron density around MN B 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



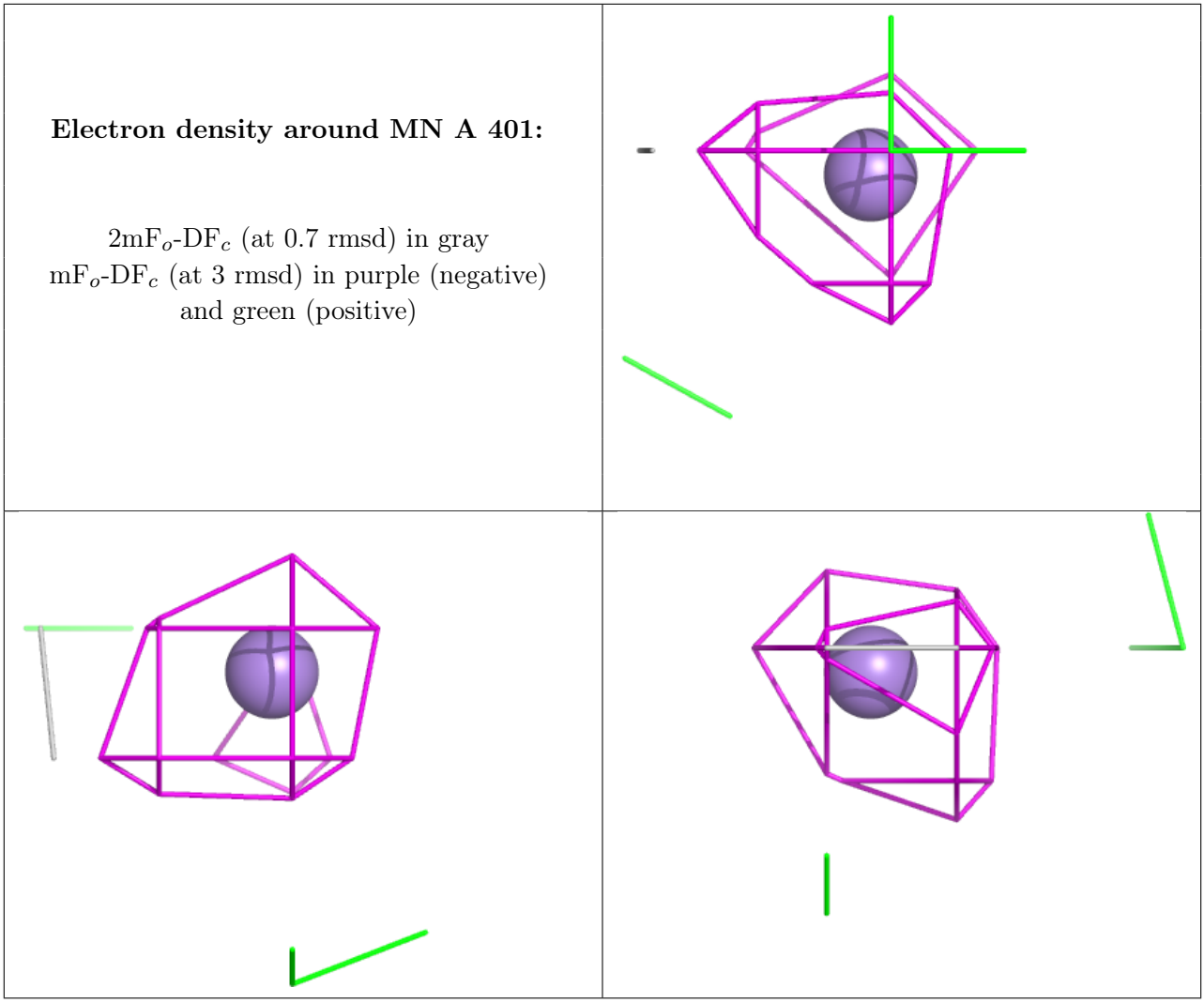
Electron density around MN C 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



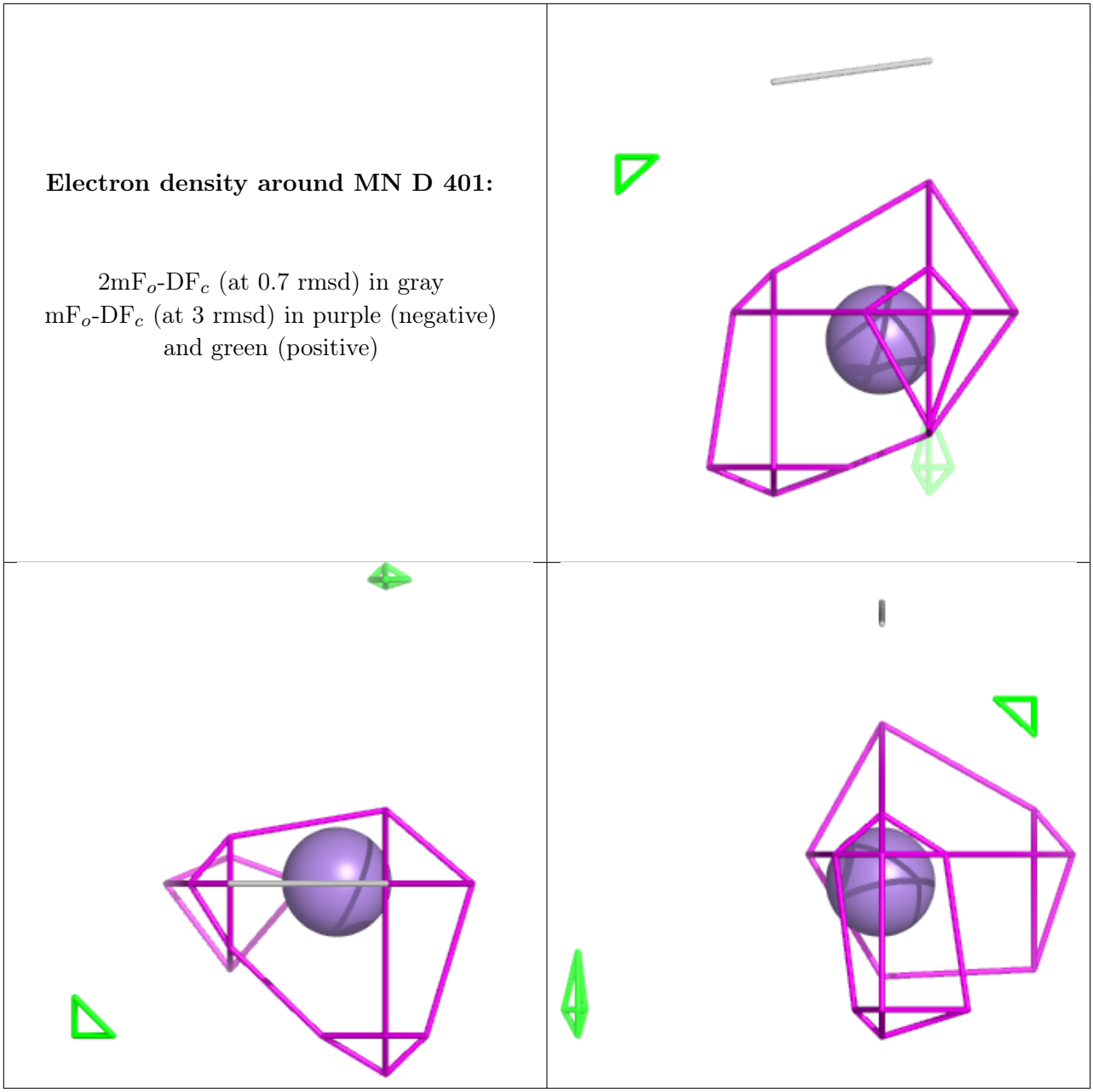
Electron density around MN A 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



Electron density around MN D 401:

$2mF_o$-DF_c (at 0.7 rmsd) in gray
mF_o-DF_c (at 3 rmsd) in purple (negative) and green (positive)



6.5 Other polymers (i)

There are no such residues in this entry.